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## IDENTIFICATION OF *PSEUDOMYS CHAPMANI*, *P. HERMANNSBURGENSIS*, *P. DELICATULUS* AND *MUS MUSCULUS* USING FOOTPAD PATTERNS.

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### ABSTRACT

Identification of 3 species of native Western Australian rodents (*Pseudomys* spp) and of the feral House Mouse (*Mus musculus*) using footpads is described. Diagrams are provided.

### INTRODUCTION

There are approximately 40 small terrestrial mammals in Western Australia. Identification of many of these species is difficult using external characters alone and positive identification can often only be obtained from skull measurements.

A study of the Western Australian Museum collections indicated that the pes (the hind foot) (Figure 1A) of many small mammals have distinctive patterns of pads which can be used to differentiate them. This paper is the first in a series to aid in the field identification of morphologically similar species.

In the Pilbara region there are 3 sympatric species of *Pseudomys*: *Pseudomys chapmani* (Pebblemound Mouse), *P. hermannsburgensis* (Sandy Inland Mouse) and *P. delicatulus* (Delicate Mouse). *P. chapmani* has a distribution ranging from east of the Cape Range in Western Australia through the northernmost part of the Pilbara region and south to the Gascoyne and Murchison districts. This species is usually trapped on or near pebble mounds associated with shallow soils and scree slopes (How, Dell & Cooper 1991).

*P. hermannsburgensis* has a wide distribution across the whole of the Pilbara, into the Northern Territory and South Australia and south as far as Bungalbin Hill in Western Australia. *P. hermannsburgensis* has been trapped on many substrates including on or near pebble mounds (How, Dell & Cooper 1991).

*P. delicatulus* occur over the northern parts of Australia; in Western Australia it extends into the northeast part of the Pilbara where it may be trapped adjacent to *P. chapmani* and *P. hermannsburgensis* (How, Dell & Cooper 1991).



Figure 1A: Photograph of the pes of *Pseudomys chapmani* showing the general characteristics.

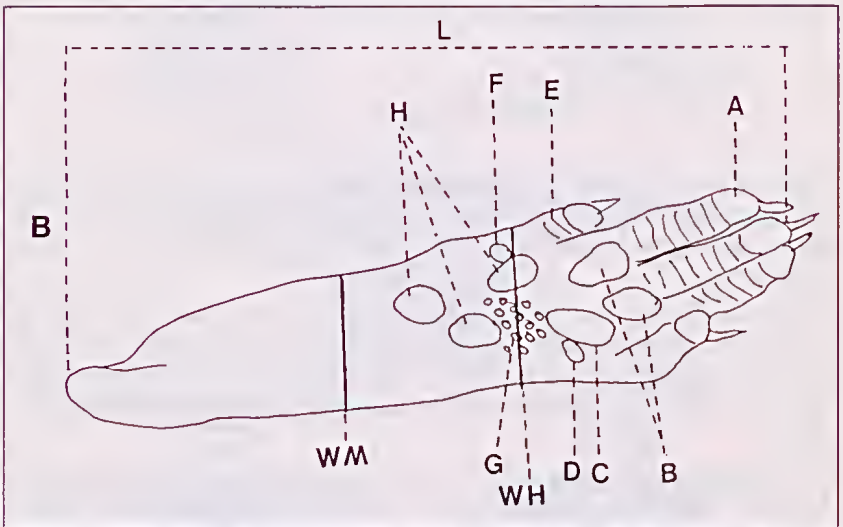


Figure 1B: Diagram of left pes of rodent. (A) Terminal pad; (B) Interdigital pads; (C) Postdigital pad; (D) Postdigital granule; (E) Hallux; (F) Posthallucal granule; (G) Granules; (H) Posthallucal pads; (L) Length of pes from toe tip (excluding nail) to heel; (WM) Width across pes at base of hallux; (WH) Width across pes at midpoint of posthallucal area.

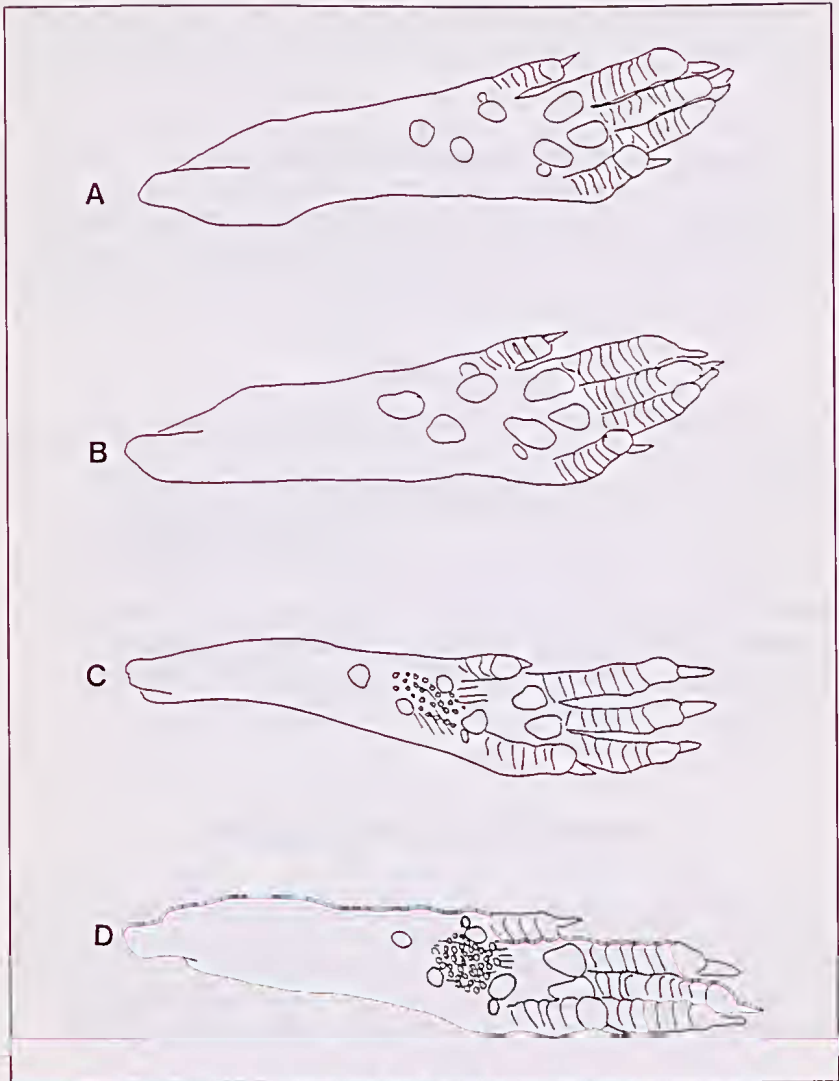


Figure 2: Diagrammatic representations of the pes of (A) *Pseudomys hermannsburgensis*; (B) *P. chapmani*; (C) *P. delicatulus*; (D) *Mus musculus*.

The pelage of these three species is very similar and *Pseudomys chapmani* and *P. hermannsburgensis* are of comparable size. *P. delicatulus* is a much smaller animal than the other two, but adults can easily be confused with the sub-adults of the other species.

*Mus musculus* is usually identified by the presence of a strong 'mouse' smell and by the notch in the upper incisors. However, *M. musculus* can be confused with *Pseudomys* when smell or notches are absent.

Measurements of the length of the pes and of the width of the pes at both the position of the hallux and at the midpoint of the posthallucal area (Figure 1B) were made of males, females, adults and sub-adults of all four species to determine whether the species could be distinguished by pes size alone (Table 1). However, because of the small difference in actual measurements, the overlap in size ranges, and difficulty in accurately measuring pes of live animals, this method of differentiation between species was found to be inadequate. Kitchener, Adams & Baverstock (1984) used the measurement of pes length versus ear length as a means of distinguishing species of *Pseudomys*. However, this method, though valuable for identifying dead specimens, is inadequate for live specimens.

Table 1: Sample size, mean and standard deviation of pes measurements (mm).

Species	N	Pes length	Pes width (hallux)	Pes width (midpoint)
<i>P. hermannsburgensis</i>	33	16.56+0.80	2.77+0.24	2.25+0.16
<i>P. chapmani</i>	14	16.07+0.77	3.06+0.17	2.53+0.11
<i>P. delicatulus</i>	15	15.75+0.74	2.48+0.20	1.11+0.16
<i>Mus musculus</i>	23	16.19+0.40	3.17+0.32	2.56+0.20

## DESCRIPTION OF PES PATTERNS

Figure 2 shows that the main difference between the pes of *Mus musculus* and most species of *Pseudomys*, other than *P. delicatulus*, is the presence of granules and hairs between and around the posthallucal pads in the former. *M. musculus* also has very distinct postdigital and posthallucal granules, these granules are indistinct or often not visible in species of *Pseudomys*.

*Pseudomys delicatulus* is unlike the two other species of *Pseudomys* in that it has granules and hairs between and around the posthallucal pads, similar to *Mus musculus*, however, the hairs are longer and more obvious in *P. delicatulus* than in *M. musculus*. A further distinguishing feature between these two species is that the postdigital and posthallucal granules are indistinct in *P. delicatulus*.

*Pseudomys hermannsburgensis* and *P. chapmani* can be differentiated by the size of the posthallucal pads. In *P. chapmani* these 3 pads are almost equal in size and are slightly larger than the terminal pads. In *P. hermannsburgensis* the 3 posthallucal pads are almost equal in size but are about half the size of the terminal pads.

It is recommended that a 10x hand lens is used when identifying *Pseudomys* spp. from footpads as the pads are difficult to distinguish with the naked eye.

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